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TECH CENTER 1600/2900

1600

RAW SEQUENCE LISTING

PATENT APPLICATION: US/09/719,024A

DATE: 01/30/2003.

TIME: 16:02:03

Input Set : N:\Crf4\01232003\I719024B.raw

Output Set: N:\CRF4\01292003\I719024A.raw

C-->

1 <110> APPLICANT: Bisaro, David M.
2 <120> TITLE OF INVENTION: Mutant Forms of the AL2 Gene of Geminiviruses
3 <130> FILE REFERENCE: 22727/04080
4 <140> CURRENT APPLICATION NUMBER: US/09/719,024A
5 <141> CURRENT FILING DATE: 2003-01-13
6 <150> PRIOR APPLICATION NUMBER: PCT/US99/12680
7 <151> PRIOR FILING DATE: 1999-06-04
8 <160> NUMBER OF SEQ ID NOS: 147
9 <170> SOFTWARE: PatentIn version 3.1

ENTERED

11 <210> SEQ ID NO: 1
12 <211> LENGTH: 129
13 <212> TYPE: PRT
14 <213> ORGANISM: Tomato golden mosaic virus
15 <400> SEQUENCE: 1
16 Met Arg Asn Ser Ser Ser Ser Thr Pro Pro Ser Ile Lys Ala Gln His
17 1 5 10 15
18 Arg Ala Ala Lys Arg Arg Ala Ile Arg Arg Arg Arg Ile Asp Leu Asn
19 20 25 30
20 Cys Gly Cys Ser Ile Tyr Ile His Ile Asp Cys Arg Asn Asn Gly Phe
21 35 40 45
22 Thr His Arg Gly Thr Tyr His Cys Ala Ser Ser Arg Glu Trp Arg Leu
23 50 55 60
24 Tyr Leu Gly Ile Asn Lys Ser Pro Leu Phe Gln Asp Asn Gln Arg Arg
25 65 70 75 80
26 Gly Ser Pro Leu His Gln His Gln Asp Ile Pro Leu Thr Asn Gln Val
27 85 90 95
28 Gln Pro Gln Pro Glu Glu Ser Ile Gly Ser Pro Gln Gly Ile Ser Gln
29 100 105 110
30 Leu Pro Ser Met Asp Asp Ile Asp Asp Ser Phe Trp Glu Asn Leu Phe
31 115 120 125
32 Lys

34 <210> SEQ ID NO: 2
35 <211> LENGTH: 129
36 <212> TYPE: PRT
37 <213> ORGANISM: Abutilon mosaic virus
38 <400> SEQUENCE: 2
39 Met Arg Ser Ser Ser Pro Ser His Pro Pro Ser Ile Lys Lys Ala His
40 1 5 10 15
41 Arg Gln Ala Lys Arg Arg Ala Ile Arg Arg Arg Arg Ile Asp Leu Gln
42 20 25 30
43 Cys Gly Cys Ser Ile Tyr Phe His Ile Asp Cys Thr Gly His Gly Phe
44 35 40 45
45 Thr His Arg Gly Thr His His Cys Thr Ser Gly Gly Glu Trp Arg Val

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46          50          55          60
47      Tyr Leu Gly Asp Lys Lys Ser Pro Val Phe Gln Asp Val Gln Ser Arg
48          65          70          75          80
49      Arg Thr Ile Ile His Gln Asn Glu Asn Ile Pro Cys Thr Asn Thr Val
50          85          90          95
51      Gln Pro Gln Pro Glu Glu Ser Val Ala Ser Pro Gln Ser Leu Pro Glu
52          100         105         110
53      Leu Pro Ser Leu Asp Asp Ile Asp Glu Ser Phe Trp Val Asn Leu Phe
54          115         120         125
55      Ser
57 <210> SEQ ID NO: 3
58 <211> LENGTH: 129
59 <212> TYPE: PRT
60 <213> ORGANISM: Abutilon mosaic virus
61 <400> SEQUENCE: 3
62      Met Arg Ser Ser Ser Pro Ser Gln Pro Pro Ser Ile Lys Lys Ala His
63          1          5          10          15
64      Arg Gln Ala Lys Arg Arg Ala Ile Arg Arg Arg Arg Ile Asp Leu Gln
65          20          25          30
66      Cys Gly Cys Ser Ile Tyr Phe His Ile Asp Cys Thr Gly His Gly Phe
67          35          40          45
68      Thr His Arg Gly Ile His His Cys Thr Ser Gly Gly Glu Trp Arg Val
69          50          55          60
70      Tyr Leu Gly Asp Ser Lys Ser Pro Val Phe Gln Asp Ile Gln Ser Arg
71          65          70          75          80
72      Gly Pro Ala Ile His Gln Asn Glu Asp Ile Pro Cys Thr Asn Thr Val
73          85          90          95
74      Gln Pro Gln Pro Glu Glu Ser Val Ala Ser Pro Gln Ser Leu Pro Glu
75          100         105         110
76      Leu Pro Ser Leu Asp Asp Phe Asp Asp Ser Phe Trp Val Asn Leu Phe
77          115         120         125
78      Lys
80 <210> SEQ ID NO: 4
81 <211> LENGTH: 129
82 <212> TYPE: PRT
83 <213> ORGANISM: Bean dwarf mosaic virus
84 <400> SEQUENCE: 4
85      Met Gln Ser Ser Ser Leu Ser Thr Pro Pro Ser Ile Lys Lys Ala His
86          1          5          10          15
87      Arg Gln Ala Lys Arg Arg Ala Ile Arg Arg Arg Arg Ile Asp Leu Glu
88          20          25          30
89      Cys Gly Cys Ser Ile Tyr Thr His Ile Gly Cys Thr Gly His Gly Phe
90          35          40          45
91      Thr His Arg Gly Ala His His Cys Thr Ser Ser Arg Glu Trp Arg Val
92          50          55          60
93      Tyr Leu Gly Asp Arg Lys Ser Pro Leu Phe Gln Asp Ile Gln Ser Arg
94          65          70          75          80
95      Gly Thr Val Val His Gln Gln Gln Gly Ile Gln Arg Thr Asp Thr Val
96          85          90          95

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97      Gln Pro Gln Pro Glu Glu Ser Val Ala Ser Pro Gln Ser Leu Pro Glu
98              100              105              110
99      Leu Pro Ser Leu Asp Asp Ile Asp Asp Ser Phe Trp Val Asp Leu Phe
100             115              120              125
101      Lys
103 <210> SEQ ID NO: 5
104 <211> LENGTH: 129
105 <212> TYPE: PRT
106 <213> ORGANISM: Bean dwarf mosaic virus
107 <400> SEQUENCE: 5
108      Met Arg Ser Ser Ser Pro Ser Gln Pro Pro Ser Ile Lys Ala Gln His
109      1              5              10              15
110      Arg Ile Ala Lys Arg Lys Ala Ile Arg Arg Arg Arg Ile Asp Leu Asn
111             20              25              30
112      Cys Gly Cys Ser Ile Phe Tyr His Ile Lys Cys Ala Asp His Gly Phe
113             35              40              45
114      Thr His Arg Gly Glu His His Cys Ala Ser Gly Arg Glu Phe Arg Phe
115             50              55              60
116      Tyr Leu Gly Gly Thr Lys Ser Pro Leu Phe Gln Asp His Ala Gly Gly
117      65              70              75              80
118      Arg Ser Ser Ile His Thr Asp Lys Asp Ile Pro His Pro Ser Gln Val
119             85              90              95
120      Gln Ser Gln Pro Gln Glu Ser Thr Gly Ser Pro Gln Ser Ile Pro Glu
121             100             105             110
122      Leu Pro Ser Leu Asp Asp Ile Asp Ser Ser Phe Trp Asp Asp Ile Phe
123             115             120             125
124      Lys
126 <210> SEQ ID NO: 6
127 <211> LENGTH: 129
128 <212> TYPE: PRT
129 <213> ORGANISM: Bean dwarf mosaic virus
130 <400> SEQUENCE: 6
131      Met Arg Ser Ser Ser Pro Ser Gln Pro Pro Ser Ile Lys Ala Gln His
132      1              5              10              15
133      Arg Ile Ala Lys Arg Arg Ala Ile Arg Arg Arg Arg Ile Asp Leu Asn
134             20              25              30
135      Cys Gly Cys Ser Ile Phe Tyr His Ile Lys Cys Ala Asp His Gly Phe
136             35              40              45
137      Thr His Arg Gly Glu His His Cys Ala Ser Gly Arg Glu Phe Arg Phe
138             50              55              60
139      Tyr Leu Gly Gly Thr Lys Ser Pro Leu Phe Gln Asp Asn Ala Gly Gly
140      65              70              75              80
141      Arg Ser Ser Ile His Thr Asp Lys Asp Ile Pro His Pro Asn Gln Val
142             85              90              95
143      Gln Ser Gln Pro Gln Glu Ser Thr Gly Ser Pro Gln Ser Ile Pro Glu
144             100             105             110
145      Leu Pro Ser Leu Asp Asp Ile Asp Ser Ser Phe Trp Asp Asp Ile Phe
146             115             120             125
147      Lys

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Input Set : N:\Crf4\01232003\I719024B.raw

Output Set: N:\CRF4\01292003\I719024A.raw

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149 <210> SEQ ID NO: 7
150 <211> LENGTH: 129
151 <212> TYPE: PRT
152 <213> ORGANISM: Bean dwarf mosaic virus
153 <400> SEQUENCE: 7
154   Met Arg Ser Ser Ser Pro Ser Gln Pro Pro Ser Ile Lys Ala Gln His
155       1           5           10           15
156   Arg Ile Ala Lys His Lys Ala Ile Arg Arg Arg Arg Ile Asp Leu Asn
157       20           25           30
158   Cys Gly Cys Ser Ile Phe Tyr His Ile Lys Cys Ala Asp His Gly Phe
159       35           40           45
160   Thr His Arg Gly Glu His His Cys Ala Ser Gly Arg Glu Phe Arg Phe
161       50           55           60
162   Tyr Leu Gly Gly Thr Lys Ser Pro Leu Phe Gln Asp His Ala Gly Gly
163       65           70           75           80
164   Arg Ser Ser Ile His Thr Asp Lys Asp Ile Pro His Pro Ser Gln Val
165       85           90           95
166   Gln Ser Gln Pro Gln Glu Ser Thr Gly Ser Pro Gln Ser Ile Pro Glu
167       100          105          110
168   Leu Pro Ser Leu Asp Asp Ile Asp Ser Ser Phe Trp Asp Asp Ile Phe
169       115          120          125
170   Lys
172 <210> SEQ ID NO: 8
173 <211> LENGTH: 129
174 <212> TYPE: PRT
175 <213> ORGANISM: cabbage leaf curl virus
176 <400> SEQUENCE: 8
177   Met Gln Asn Ser Ser Leu Leu Lys Pro Pro Ser Ile Lys Ala Gln His
178       1           5           10           15
179   Lys Ile Ala Lys Arg Arg Ala Val Arg Arg Arg Arg Ile Asp Leu Asn
180       20           25           30
181   Cys Gly Cys Ser Ile Phe Leu His Ile Asn Cys Ala Asp Asn Gly Phe
182       35           40           45
183   Thr His Arg Gly Glu His His Cys Ser Ser Gly Arg Glu Phe Arg Phe
184       50           55           60
185   Tyr Leu Gly Gly Ser Lys Ser Pro Ile Phe Gln Asp Thr Thr Arg Arg
186       65           70           75           80
187   Gly Pro Val Val His Gln Asn Gln Asp Leu Pro His Pro Ser Pro Val
188       85           90           95
189   Gln Pro Gln Pro Thr Glu Ser Ile Gly Ser Pro Gln Ser Leu Leu Gln
190       100          105          110
191   Leu Pro Ser Leu Asp Asp Phe Asp Glu Ser Phe Trp Ala Asp Ile Phe
192       115          120          125
193   Lys
195 <210> SEQ ID NO: 9
196 <211> LENGTH: 129
197 <212> TYPE: PRT
198 <213> ORGANISM: Potato yellow mosaic virus
199 <400> SEQUENCE: 9

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RAW SEQUENCE LISTING

DATE: 01/30/2003

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TIME: 16:02:03

Input Set : N:\CrF4\01232003\I719024B.raw

Output Set: N:\CRF4\01292003\I719024A.raw

```

200 Met Arg Ser Ser Ser Pro Ser Gln Pro Pro Ser Ile Lys Lys Ala His
201 1 5 10 15
202 Arg Gln Ala Lys Lys Arg Ala Ile Arg Arg Arg Arg Ile Asp Leu Asp
203 20 25 30
204 Cys Gly Cys Ser Ile Tyr Phe His Ile Asp Cys Ala Gly His Gly Phe
205 35 40 45
206 Thr His Arg Gly Ala His His Cys Thr Ser Gly Arg Glu Trp Arg Val
207 50 55 60
208 Tyr Leu Gly Asp Arg Lys Ser Pro Leu Phe Gln Asp Lys Pro Ser Arg
209 65 70 75 80
210 Gly His Ala Ile His Gln Asp Gln Asp Ile Gln Arg Pro Asn Pro Val
211 85 90 95
212 Gln Pro Gln Pro Gln Glu Ser Ile Gly Ser Pro Gln Ser Ile Pro Glu
213 100 105 110
214 Leu Pro Ser Leu Asp Asp Ile Asp Asp Ser Phe Trp Val Glu Leu Phe
215 115 120 125

```

216 Ser

218 <210> SEQ ID NO: 10

219 <211> LENGTH: 129

220 <212> TYPE: PRT

221 <213> ORGANISM: Sida golden mosaic geminivirus

222 <400> SEQUENCE: 10

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223 Met Arg Ser Ser Ser Pro Ser Thr Pro Pro Ser Ile Lys Lys Thr His
224 1 5 10 15
225 Arg Gln Ala Lys Lys Arg Ser Val Arg Arg Arg Arg Ile Asp Leu Glu
226 20 25 30
227 Cys Gly Cys Ser Ile Tyr Phe His Ile Gly Cys Thr Gly His Gly Phe
228 35 40 45
229 Thr His Arg Gly Thr His His Cys Thr Ser Phe Arg Glu Trp Arg Leu
230 50 55 60
231 Tyr Leu Gly Asp Arg Lys Ser Pro Leu Phe Gln Asp Ile Gln Gly Arg
232 65 70 75 80
233 Gly Ser Thr Val His Glu His Gln Asp Ile Gln Tyr Pro Asn Phe Val
234 85 90 95
235 Gln Pro Gln Pro Glu Glu Ser Val Ala Ser Pro Gln Ser Val Pro Glu
236 100 105 110
237 Leu Pro Ser Leu Asp Asp Ile Pro Asp Ser Phe Trp Val Asp Leu Phe
238 115 120 125

```

239 Lys

241 <210> SEQ ID NO: 11

242 <211> LENGTH: 131

243 <212> TYPE: PRT

244 <213> ORGANISM: Squash leaf curl virus

245 <400> SEQUENCE: 11

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246 Met Pro Asn Ser Ser Ser Ser Lys Val Pro Ser Ile Lys Ala Gln His
247 1 5 10 15
248 Arg Ile Ala Lys Lys Arg Ala Val Arg Arg Arg Arg Ile Asp Leu Asp
249 20 25 30
250 Cys Gly Cys Ser Ile Tyr Ile His Ile Asn Cys Ala Lys Asp Gly Asn

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RAW SEQUENCE LISTING ERROR SUMMARY
PATENT APPLICATION: US/09/719,024A

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Input Set : N:\Crf4\01232003\I719024B.raw
Output Set: N:\CRF4\01292003\I719024A.raw

Please Note:

Use of n and/or Xaa have been detected in the Sequence Listing. Please review the Sequence Listing to ensure that a corresponding explanation is presented in the <220> to <223> fields of each sequence which presents at least one n or Xaa.

Seq#:101; N Pos. 703,724
Seq#:114; N Pos. 1437
Seq#:130; N Pos. 1255

Invalid Line Length:

The rules require that a line not exceed 72 characters in length. This includes spaces.

Seq#:98; Line(s) 1982
Seq#:114; Line(s) 2811

VERIFICATION SUMMARY

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PATENT APPLICATION: **US/09/719,024A**

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Input Set : **N:\Crf4\01232003\I719024B.raw**Output Set: **N:\CRF4\01292003\I719024A.raw**

L:4 M:270 C: Current Application Number differs, Wrong Format
L:2158 M:341 W: (46) "n" or "Xaa" used, for SEQ ID#:101 after pos.:660
L:2159 M:341 W: (46) "n" or "Xaa" used, for SEQ ID#:101 after pos.:720
L:2840 M:341 W: (46) "n" or "Xaa" used, for SEQ ID#:114 after pos.:1380
L:3708 M:341 W: (46) "n" or "Xaa" used, for SEQ ID#:130 after pos.:1200